2000-2001 EDUCATIONAL GRANT APPLICATION

PROJECT TITLE: Aquaculture

APPLICANT(S):

Name Eric Clark

Home Address 10 Deerfield Trail Woodbine NJ 08270

Home Phone 628-4425

School Name Middle Township Middle School

School Address 300 East Pacific Ave. CMCH NJ

School Phone 465-1834

County Cape May

Social Security Number

PROJECT SUMMARY:

Please read attached

CURRICULUM STANDARDS: List core curriculum standards being taught or met.

TARGET AUDIENCE: 7th and 8th grade Science

GRANT PERIOD: Month/Year 09-2000 to Month/Year on going

EVALUATION CRITERIA: Describe how will you evaluate your project.

Please read attached

BUDGET: Attach an itemized budget indicating how the grant money would be spent.

RECOMMENDATIONS: Attach the names and addresses of three persons supplying letters of professional recommendation. (Letters to be included by applicant.)

(add additional sheets if necessary)

Proposal Cover Page

Fishing in Cape May County is both a livelihood and recreational sport. Due to the increasing cost of fishing, over fishing in areas attributed to a growing demand, and the depletion of many stocks caused by pollution, aquaculture is fast becoming an important aspect of our society.

The 7thand 8th grade students of the Humanities Team of the Middle Township Middle School in Cape May Court House, NJ. have incorporated the study of aquaculture into the Science curriculum. We have utilized a 400-gallon tank provided to us by the administration along with additional supplies to aid the program. This project, in its infancy, has developed a partnership with individuals at Harbor Branch Oceanographic Institute located in Florida and local biologists from the Rutgers Shellfish Research Laboratory in New Jersey who offer assistance to the aquaculture program.

The grant would provide monies to purchase a 50 gallon Micro fish Farm tank to hold additional aquatic life and supplies needed to properly expand our program. Your grant will enable us to service more students with actual hands-on experiences in the growing field of aquaculture, to gather extensive, long-term data, and to utilize scientific inquiry in studying the relationship between a species and it environment. Extended activities will include research, communications, and community service.

Objectives I Planned Outcomes

- Students will test and record daily water samples of aquaculture tanks. (temp., nitrite, ammonia, pH)
- Students will predict factors that will influence the growth rate of various aquatic animals.
- Students will develop and implement a maintenance program for the effective operation of aquatic tanks.
- Students will develop skills for the care of various aquatic animals.
- Students will graph recorded data from daily water samples to show trends.
- Students will demonstrate civic responsibility by donating vegetables to local shelters.
- Students will analyze and record the life cycle involved between polyculture and hydroponics

Students will cultivate vegetables using the hydroponics method.
Students will identify and label biological parts of various types of aquatic animals located in aquaculture tanks.
Students will evaluate methodology of different types of farm enclosures.

Methods/Strategies

The methodologies and strategies being employed in the science classroom at this time are part of an on going process. We have a 400- gallon mini-fish farm that currently houses 30 Tilapia. Most of the objectives in section 3 are being met in the classroom setting. The other objectives, as listed, could be met with additional supplies

Fifty-one Seventh grade students are involved in the daily testing procedures of the water samples, which are paramount to the functioning of the aquaculture program. The testing procedure, which includes readings on the pH, nitrite, ammonia and temperature levels, provides students with pertinent information on factors which influence the growth rates of the aquatic animals. This daily procedure takes the students 15 - 20 minutes each class period to conduct. In addition, students are introduced to chemicals which affect each of the crucial elements involved in the life of the aquatic animals, The students work in rotating cooperative learning groups using these chemicals to influence the various water conditions. This cooperative learning group fosters teamwork and a

sense of accomplishment. During this procedure the teacher works as a facilitator to brainstorm possible solutions to the potential problems and actual problems as they arise. The aquatic program encompasses cross - curricular activities with Math, Science, History and Language Arts

classes. Some of these cross-curricular activities are more thoroughly discussed in the sample lessons.

Fifty-eight eighth grade students are also involved in the testing procedure at a higher level. These rotating cooperative learning groups have the additional responsibility for the cleaning and maintenance of the aquaculture tanks. Cleaning and maintenance of these tanks requires students to conduct major water changes and remove the algae from the sides of the tanks. This process is extremely important to keep ammonia and nitrites at acceptable levels. They are also involved in the collection of data with Rainbow Trout that will eventually be housed in the larger tank when they are ready. These 30 trout are currently in regular 10- gallon fish tanks.

Sample lessons to meet each objective:

- On a daily basis, students will test a daily water sample that affects the aquatic animals. Using a cooperative learning group, the teacher will demonstrate the proper testing techniques and provide students with hands-on experiences. Once these students feel comfortable with the process, they will, in turn, train another cooperative learning group. This process will continue throughout the year. At this time, the teacher is only used as a facilitator to aid and encourage students to problem solve various conditions that may arise.

- As problems present themselves, students will need to identify and predict materials and conditions that will affect the growth rate of the aquatic animals. The teacher would conduct a mini lesson showing students how to manipulate the pH, nitrite, ammonia and temperature by using several techniques.

- Students will also be developing a tremendous amount of responsibility while implementing hands-on strategies that are extremely important to maintaining the aquaculture program. Cleaning and maintaining of the tank and the area around the tank is essential for employing the scientific method.

- Implemented cross--curricular activities will include, but not be limited to, mathematical graphing of data from the daily water sampling. The historical aspect of aquaculture and the different aquatic species will be

discussed in the Social Studies realm. Language Arts activities may include continual comparing and contrasting journal entries which would trace the different growth rates of various species of aquatic animals. Students will develop civic responsibility by cultivating various types of vegetables through the hydroponic method. The produce will then be donated to local shelters. Hydroponics will run in conjunction with the already existing aquaculture program.

Core Curricular Standards being met include:

• Cross-Content Workplace Readiness

- Standard I All students will develop career planning and workplace readiness skills.

- Standard 2 All students will use information, technology, and other tools.

- Standard 3 All students will use critical thinking, decision-making, and problem solving skills.

- Standard 4 All students will demonstrate self-management skill. - Standard 5 All students will apply safety principles.

• Grade 7 Science Core Curriculum Standards 5.515.6 Traits of living things 5.6 Plants

5.1/5.615.7 Vertebrates

5.1/5.6/5.12 Environment

Grade 8 Science Core Curriculum Standards - 5.6 Invertebrates

- 5.115.615.7/5.12 Plants - 5.5/5.12 Environment - 5.6 Water Biomes

- 5.1 0 The Earth's ocean

Teaching schedule:

8:00 - 8:45 (25) 7th grade science students 15 - 20 minutes of exposure to aquaculture program on a daily basis.

10: 1 5 - 11:00 (26) 7th grade science students 15 -20 minutes of exposure to aquaculture program on a daily basis.

I 1:00 - 1 1:45 (28) 8th grade science students 15 - 20 minutes of exposure to aquaculture program on a daily basis.

1:30 - 2:15 (30) 8thgrade science students 15 - 20 minutes of exposure to aquaculture program on a daily basis.

Project Management

I am but an individual on a team known as Humanities. There are three other teachers as well as an in-class support teacher who make up our team. We will be able to use our team planning time to discuss and initiate our cross-curricular activities, which will span the entire academic year. Each individual will be responsible for the creation of activities located in their area of expertise, which will be applied to the aquaculture program. The Science teacher will oversee the purchasing and/or procuring of materials needed to make the program a success.

Safety protocol procedures will be followed during the testing process for the daily water samples. These safety expectations will include the proper usage of rubber gloves, eyewear and lab coats. The 50 gallon aquaculture tank will be placed in a temperature controlled environment which will be closely monitored by myself as well as other members of the Humanities team. Students will have an opportunity to spend 15 - 20 minutes of hands-on experimentation. Additional time will be set aside for the teachers who conduct other avenues of the aquaculture program in their specific field of study.

Budget

The following materials are needed to expand the students' involvement in our existing aquaculture program. Materials would aid actual hands-on experiences offered to the involved students:

* Micro Fish Farm 50 gallon 639.00 Evaluation

Upon the completion of the school year, I will provide you with written documentation demonstrating that the aforementioned goals and objectives were met for this specific program. Any news releases, publications, donations or community related activities would be shared with the NJ Agriculture Society. We will provide graphs that will trace the growth rate and various items tested during the daily water samples. This project will benefit students not only this year but for many

years to come. We hope to continue to build a successful aquaculture program with additional funding.